MYCOTAXON

ISSN (print) 0093-4666 (online) 2154-8889 Mycotaxon, Ltd. ©2017

October–December 2017—Volume 132, pp. 977–983
https://doi.org/10.5248/132.977

Anisogenispora insignissima gen. & sp. nov. from the Brazilian semi-arid region

Sheila Miranda Leão-Ferreira[1],
Luis Fernando Pascholati Gusmão[1*] & Rafael F. Castañeda-Ruiz[2]

[1] *Universidade Estadual de Feira de Santana*
Avenida Transnordestina, s/n, Novo Horizonte, 44036-900, Feira de Santana, Brazil
[2] *Instituto de Investigaciones Fundamentales en Agricultura Tropical (INIFAT) Alejandro de Humboldt, Calle 1 Esq. 2, Santiago de Las Vegas, C. Habana, Cuba, C.P. 17200*

* Correspondence to: *lgusmao@uefs.br*

Abstract—A new genus and species *Anisogenispora insignissima* is described and illustrated. The fungus, found on decaying fruit of an unidentified dicotyledonous plant, is distinguished by blastic production of globose to broadly pyriform, 1–2-septate, bicolored conidia and a *Thielaviopsis*-like synanamorph with lenticular, doliiform, cylindrical, or vermiform, unicellular or multiseptate, black conidia produced by thallic-arthric disarticulation. All conidiogenous events originate on the same conidiophores.

Key words—asexual fungi, hyphomycetes, taxonomy, tropics

Introduction

The Brazilian semiarid region, located in the northeast of the country, covers approximately 900,000 km^2 and exhibits a high biodiversity (Giulietti et al. 2006). Its different vegetation has favored highly diverse microfungi and the discovery of several new species (e.g., Almeida et al. 2014, Barbosa et al. 2013, Fiuza et al. 2014, Leão-Ferreira et al. 2015, Monteiro et al. 2016, Silva & Gusmão 2013, Silva et al. 2014). During a mycological survey of conidial fungi from the semi-arid region in Serra do Ramalho, Bahia State, an interesting fungus was collected that showed remarkable differences from all previously described hyphomycetes (Seifert et al. 2011); it is described here as a new genus and species.

Materials & method

Samples of decaying plant materials collected in Serra do Ramalho, Bahia State were placed in plastic bags for transport to the laboratory where they were treated according to Castañeda-Ruiz et al. (2016) and placed in humid chambers. Several attempts to obtain these species in pure culture were unsuccessful after transferring conidia with a flamed needle to malt extract agar [2% (w/v) malt extract and corn meal agar, mixed 1:1 with carrot extract] incubated at 25 °C. Mounts were prepared in PVL (polyvinyl alcohol, lactic acid) and measurements were made at 1000× magnification. Microphotographs were obtained with an Olympus BX51 microscope equipped with bright field and Nomarski interference optics. The type specimen is deposited in the Herbarium of Universidade Estadual de Feira de Santana, Bahia, Brazil (HUEFS).

Taxonomy

Anisogenispora S.M. Leão, Gusmão & R.F. Castañeda, **gen. nov.**

Index Fungorum IF 552545

Differs from *Repetophragma* by its monoblastic and polyblastic conidiogenous cells with percurrent and sympodial extensions and by its chlamydospore-like synanamorph with thallic-arthric disarticulation originating near the conidiophore apex.

Type Species: *Anisogenispora insignissima* S.M. Leão et al.

Etymology: *aniso-* (Greek) meaning unequal, uneven, or dissimilar + *-geni-* (Latin) meaning born or produced and referring to the blastic and thallic modes of conidial ontogeny + *-spora* (Latin) referring to the conidia.

Colonies on the natural substrate effuse, brown. Conidiophores macronematous, mononematous. Conidiogenous cells monoblastic and polyblastic, integrated, indeterminate, with enteroblastic percurrent extension, sometimes polyblastic with sympodial extension; conidial secession schizolytic. Conidia solitary, brown, euseptate, smooth, dry. Synanamorph *Thielaviopsis*-like, terminal, dark brown, euseptate, originating near the apex of the conidiophores, forming conidia by thallic-arthric disarticulation; conidial secession schizolytic; conidia unicellular or multicellular, dark brown or black, smooth.

Anisogenispora insignissima S.M. Leão, Gusmão & R.F. Castañeda, **sp. nov.** Figs 1–3

Index Fungorum IF 552546

Differs from *Repetophragma biseptatum* and *R. quadriloculare* by its conidiogenous cells with percurrent and sympodial extension and by its *Thielaviopsis*-like synanamorph originating from the conidiophores and conidia.

Type: Brazil, Bahia State, Coribe, Serra do Ramalho, 43°47′W 13°32′S, alt. 450–600 m, on fallen decaying fruit of an unidentified dicotyledonous plant, 16.III.2008, coll. S.M. Leão-Ferreira (**Holotype**, HUEFS 210449).

Etymology: *insignissima* (Latin) meaning very remarkable, referring to pleomorphic conidia produced on the same conidiophores.

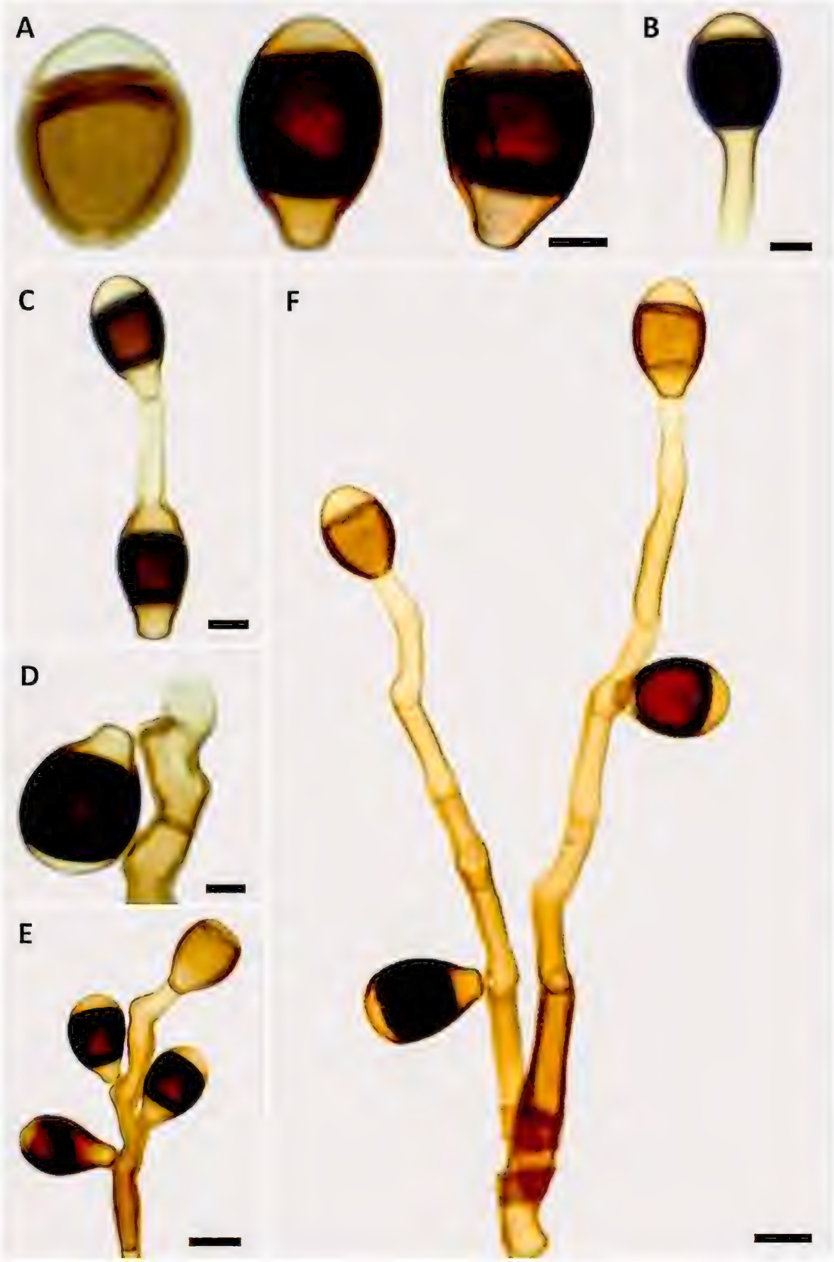
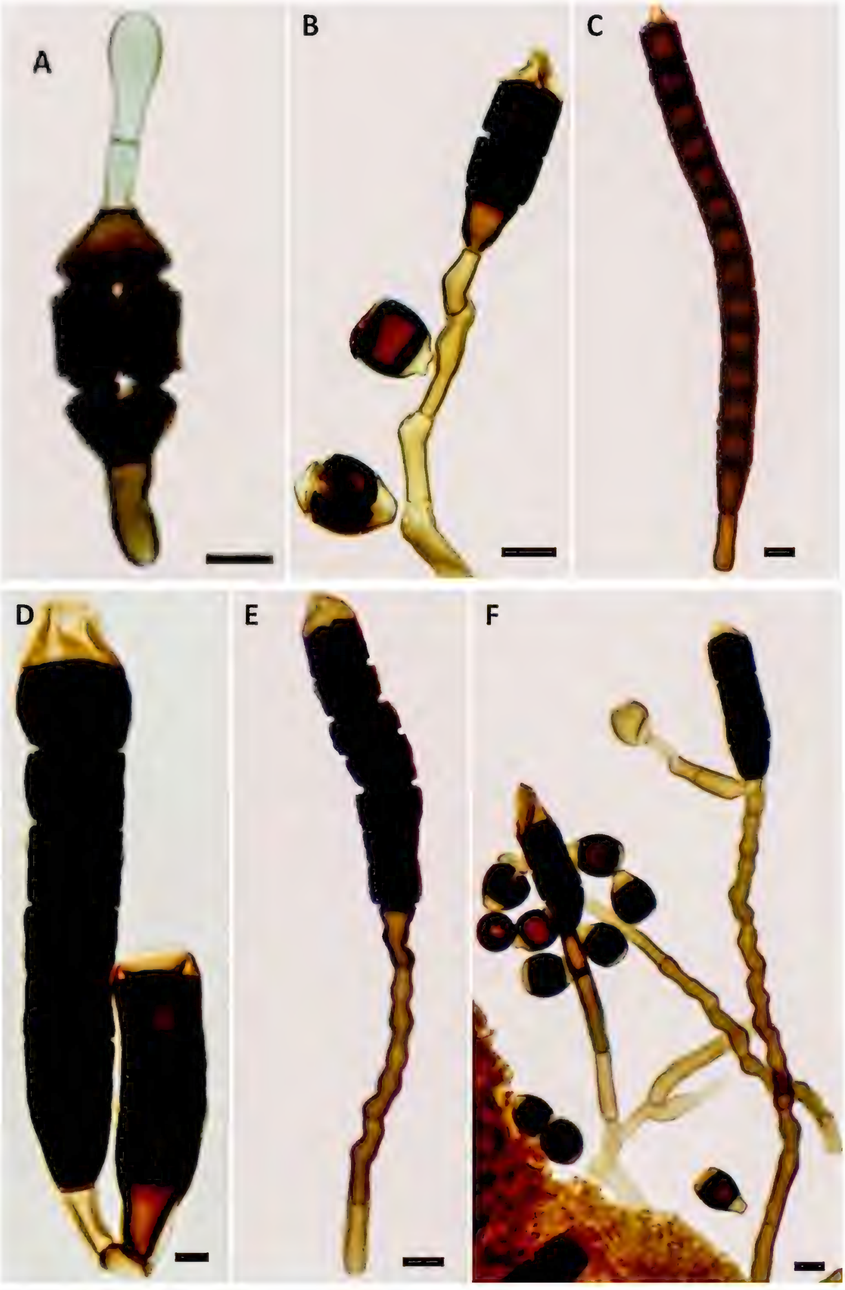


Fig. 1. *Anisogenispora insignissima* (holotype, HUEFS 210449). A–C. Conidia. D, E. Conidiogenous cells and conidia. F. Conidiophores, conidiogenous cells, and conidia. Scale bars = 10 µm.

Colonies on the natural substrate effuse, hairy-granulose, dark brown to black. Mycelium superficial and immersed, composed of septate, branched, smooth, 2–4 µm diam, brown to pale brown hyphae. Conidiophores macronematous, mononematous, erect, flexuous, straight or geniculate, unbranched, rarely branched, 2–7-septate, brown, or alternately and irregularly versicolored brown, pale brown or dark brown, 90–300 × 7.5–10 µm, with 4–12 enteroblastic percurrent extensions, smooth. Conidiogenous cells monoblastic, sometimes polyblastic, cylindrical, integrated, indeterminate, terminal becoming intercalary with frequent and numerous enteroblastic percurrent extensions and sometimes with holoblastic, sympodial extension after a percurrent extension, 8–20 × 3 µm, smooth, pale brown to brown. Conidiogenous loci flat. Conidia solitary, acrogenous or acropleurogenous, broad pyriform, subglobose, somewhat turbinate to obovoid, (1–)2-septate, bicolored, basal and apical cells pale brown, middle cell dark brown or black, smooth, 17.5–30 × 12.5–20 µm. Synanamorph *Thielaviopsis*-like, single, doliiform, cylindrical, vermiform, or long fusiform to navicular, mostly terminal, 2–16-euseptate, slightly constricted at the septa, 50–200 × 15–28 µm, very dark brown or black, originated near or at the apex of the conidiophores and conidia, forming thallic-arthric conidia by disarticulation at the septa; conidial secession schizolytic; conidia lenticular, doliiform, cylindrical, 0–12-septate, dark brown or black, 8–120 × 13–28 µm, smooth, dry.

Note: *Anisogenispora insignissima* resembles *Repetophragma biseptatum* (M.B. Ellis) Subram. and *R. quadriloculare* (Matsush.) R.F. Castañeda et al. in conidial shape and the enteroblastic percurrent extension of the conidiogenous cells, but *R. biseptatum* and *R. quadriloculare* do not have sympodial extension of the conidiogenous cells (Castañeda-Ruiz et al. 2011), nor do they produce a *Thielaviopsis*-like synanamorph with thallic-arthric conidial ontogeny such as is present on the conidiophores in *A. insignissima*. Hyphae in some species of *Chalara* (Corda) Rabenh. develop *Thielaviopsis*-like synanamorphs (similar to the *A. insignissima* synanamorph), but *Chalara* exhibits an enterogenous conidial ontogeny, considered as phialidic (Nag Raj & Kendrick 1976). The *Thielaviopsis*-like synanamorph produced in *Arthrotaeniolella* L.B. Conc. et al.

Fig. 2. *Anisogenispora insignissima* (holotype, HUEFS 210449). A. Young growing conidium from *Thielaviopsis*-like synanamorph after its germination. B. Conidiogenous cells, conidia, and *Thielaviopsis*-like synanamorph. C,D. Thallic-arthric conidia of *Thielaviopsis*-like synanamorph. E, F. Conidiogenous cells, conidia, and thallic-arthric conidia of *Thielaviopsis*-like synanamorph. Scale bars = 10 µm.


A
B
C
D
E
F

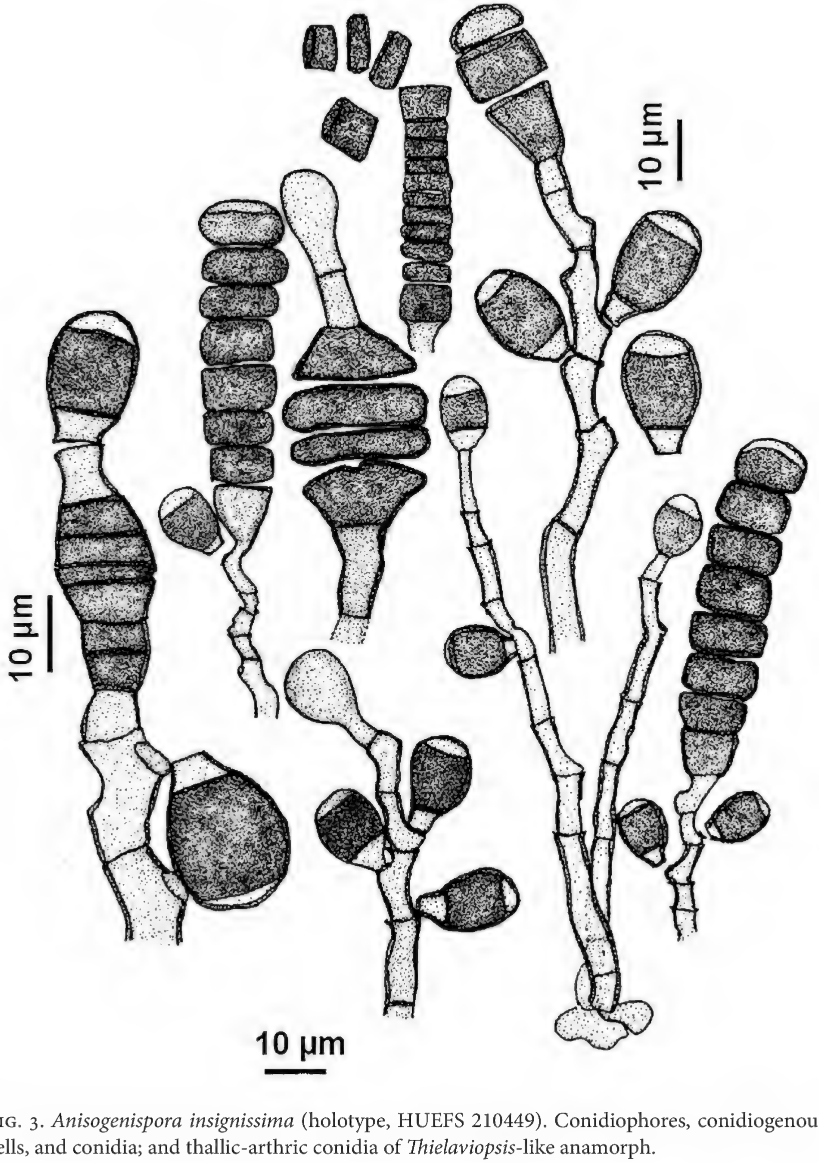


Fig. 3. *Anisogenispora insignissima* (holotype, HUEFS 210449). Conidiophores, conidiogenous cells, and conidia; and thallic-arthric conidia of *Thielaviopsis*-like anamorph.

is also somewhat similar to that of *A. insignissima*, but *Arthrotaeniolella* species are freshwater fungi with thallic-arthric disarticulation of the conidiophore branches (Monteiro et al. 2017).

Acknowledgments

We are indebted to Dr. Xiu Guo Zhang and Dr. De-Wei Li for their critical reviews. The authors thank to the National Council for Scientific and Technological Development (CNPq; Proc. 451991/2016-8). The first author is grateful to Coordination for the Improvement of Higher Education Personnel (CAPES) through project Nº 071/2012. RFCR is grateful to OSDE, Grupo Agrícola from the Cuban Ministry of Agriculture and Programa de Salud Animal y Vegetal, project P131LH003033. Dr. Lorelei L. Norvell's editorial review and Dr. Shaun Pennycook's nomenclature review are greatly appreciated.

Literature cited

Almeida DAC, Miller AN, Gusmão LFP. 2014. New species and combinations of conidial fungi from the semi-arid Caatinga biome of Brazil. Nova Hedwigia 98: 431–447. https://doi.org/10.1127/0029-5035/2013/0162

Barbosa FR, Raja HA, Shearer CA, Gusmão LFP. 2013. Some freshwater fungi from the Brazilian semi-arid region, including two new species of hyphomycetes. Cryptogamie, Mycologie 34: 243–258. https://doi.org/10.7872/crym.v34.iss2.2013.243

Castañeda-Ruiz RF, Heredia G, Arias RM, McKenzie EHC, Hyde KD, Stadler M, Saikawa M, Gené J, Guarro J, Iturriaga T, Minter DW, Crous PW. 2011. A new species and re-disposed taxa in *Repetophragma*. Mycosphere. 2: 273–289.

Castañeda-Ruiz RF, Heredia G, Gusmão LFP, Li DW. 2016. Fungal diversity of Central and South America. 197–217, in: DW Li (ed.). Biology of Microfungi. Springer International Publishing. https://doi.org/10.1007/978-3-319-29137-6_9

Fiuza PO, Gusmão LFP, Cruz ACR, Castañeda Ruíz RF. 2014. Conidial fungi from the semiarid Caatinga biome of Brazil: a new species of *Pseudoacrodictys*. Mycotaxon 127: 33–37. https://doi.org/10.5248/127.33

Giulietti AM, Harley RM, Queiroz LP, Rapini A. 2006. To set the scene. In: Giulietti AM, Queiroz LP, Rapini A. (Eds). Towards greater knowledge of the Brazilian semi-arid biodiversity. Ministério da Ciência e Tecnologia. Brasília.

Leão-Ferreira SM, Gusmão LFP, Almeida DAC, Castañeda- Ruiz RF. 2015. *Digicatenosporium polyramosum*, a new hyphomycete from Brazil. Mycotaxon 130: 479–482. https://doi.org/10.5248/130.479

Monteiro JS, Gusmão LFP, Castañeda-Ruiz RF. 2016. *Pleurothecium bicoloratum* & *Sporidesmiopsis pluriseptata* spp. nov. from Brazil. Mycotaxon 131: 145–152. https://doi.org/10.5248/131.145

Monteiro JS, Gusmão LFP, Conceição LB, Castañeda-Ruiz RF. 2017. *Arthrotaeniolella aquatica* gen. & sp. nov. and *Pseudospiropes piatanensis* sp. nov. from Brazil. Mycotaxon 132: 373–379. https://doi.org/10.5248/132.373

Nag Raj TR, Kendrick WB. 1976. A monograph of *Chalara* and allied genera. Wilfrid Laurier University Press, Waterloo, Ontario, Canada. 200 p.

Seifert K, Morgan-Jones G, Gams W, Kendrick B. 2011. The genera of hyphomycetes. CBS Biodiversity Series 9. 997 p.

Silva SS, Gusmão LFP. 2013. Conidial fungi from the semi-arid Caatinga Biome of Brazil. A new species of *Dictyochaeta*. Mycosphere 4(4): 701–705. https://doi.org/10.5943/mycosphere/4/4/6

Silva SS, Cruz ACR, Gusmão LFP, Castañeda-Ruiz RF. 2014. *Diplococcium variegatum*, a new conidial fungus from the semi-arid Caatinga biome of Brazil. Mycotaxon 127: 59–62. https://doi.org/10.5248/127.59